



## **ENVIRONMENTAL RESTORATION PROGRAM**

# **Lawrence Berkeley National Laboratory**

*An update on the progress of Lawrence Berkeley National Laboratory's Environmental Restoration Program*

### **The Environmental Restoration Program**

The Environmental Restoration Program (ERP) is conducted under the Resource Conservation and Recovery Act (RCRA) Corrective Measure Process and is designed to: identify areas of soil and groundwater contamination that may have resulted from past releases of contaminants to the environment; determine the sources and extent of the contamination; and develop and implement plans to remediate contaminated areas. These activities comply with all applicable federal, state, and local regulations.

"Interim corrective measures," are used to remove or prevent movement of contamination once it is identified, especially where the presence or movement of contamination poses an immediate risk to human health or the environment. This fact sheet is an update of some of the interim corrective measures at Berkeley Lab has implemented as part of its ERP.

### **INTERIM CORRECTIVE MEASURES**

Throughout the RCRA Facility Investigation (RFI) Phase of the program, Berkeley Lab has conducted interim corrective measures in consultation with regulators.

These measures include:

- removing sources of contamination,
- stopping discharge of contaminated groundwater to surface waters,
- eliminating potential pathways that could contaminate groundwater, and
- preventing further migration of contaminated groundwater.

### **Source Removal**

Berkeley Lab has identified some of its potential sources of contamination by reviewing past records, conducting visual site inspections and subsequent detailed investigations. The term "source" refers to the original cause of release, as well as soils and groundwater directly contaminated by the original release. Berkeley Lab has removed several sources of contamination since the start of the ERP. An example of source removal is the abandoned Building 7 sump (See Figure 1: Site Map).

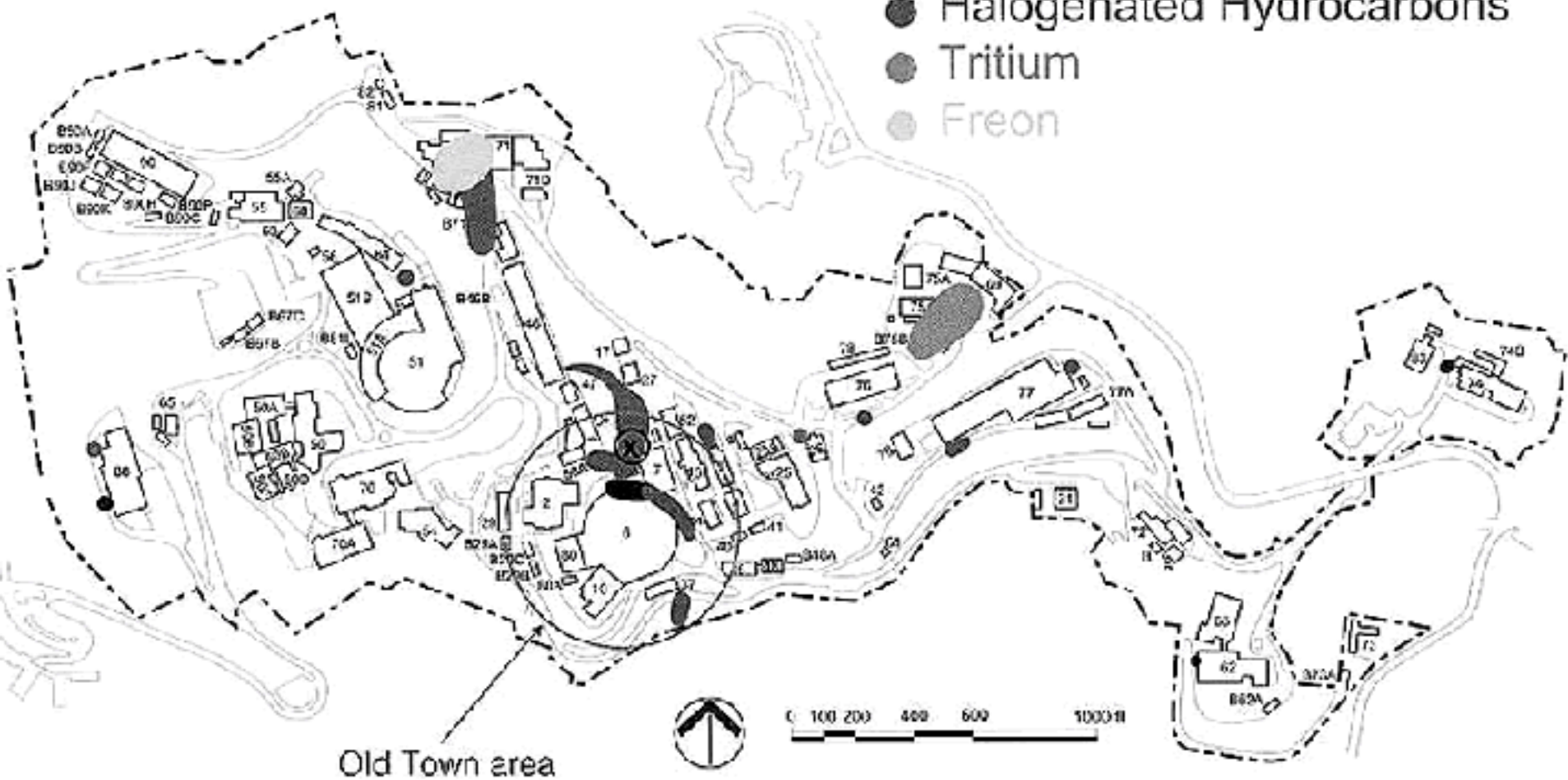
In 1992, during the RCRA Facility Assessment phase of the program, an abandoned sump was discovered north of Building 7 in the "Old Town" area of Berkeley Lab. The sump was next to a former plating shop and is believed to be the major source of soil and groundwater contamination in the "Old Town" area. "Old Town" is the original laboratory site established in the 1940s. (See Figure 1: Site Map.) The sump contained some perchloroethylene, a solvent commonly used as a degreaser. More than 35 years ago, the sump that contained industrial solvents was backfilled with soil and covered with a concrete slab.

The interim corrective measures included removing the concrete slab and the sump contents. Because underground utilities such as sanitary sewers and storm drains passed through and next to the sump, it could not be removed at the time of discovery in 1992. Recently, utilities were relocated, and the sump was removed along with highly contaminated soil around it. The soil was disposed of in accordance with regulatory requirements.





- Fuel-related Hydrocarbons
- Halogenated Hydrocarbons
- Tritium
- Freon





The two main types of rock formations under the Berkeley Lab are sedimentary and volcanic, each having distinct physical characteristics. The layering, folding, and faulting of these rocks have created a complex geology. Year-round springs, intermittent surface seeps, and variable water levels are indicators of the complex hydrology.

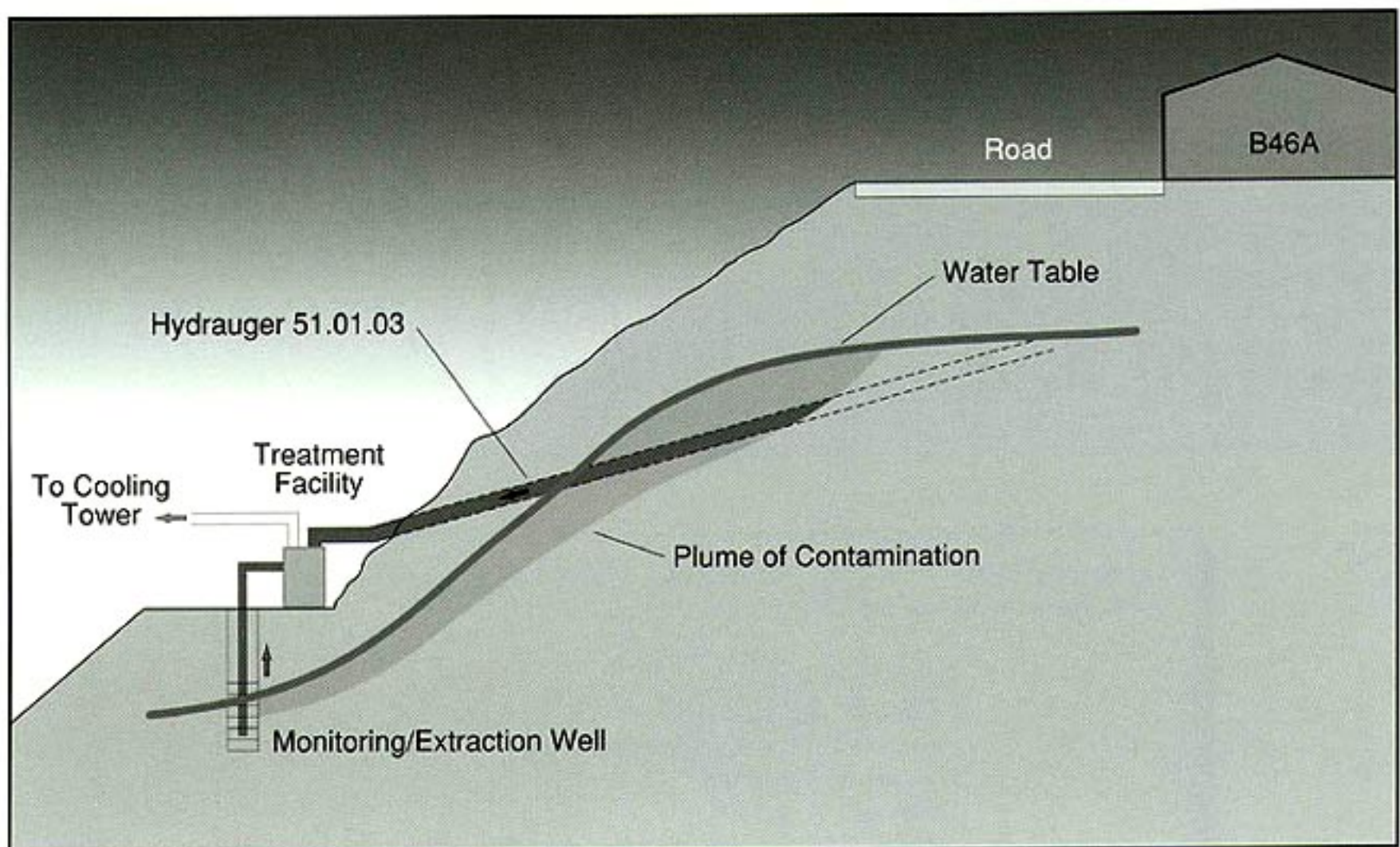
The combined geologic and hydrologic characteristics of the site have resulted in several active landslides. In the past, the lab installed free-flowing sub-horizontal drains (hydraugers) to lower groundwater levels and stabilize landslides. (See Figure 2.) As part of an interim corrective measure, the lab has installed a system to collect and treat the discharge from hydraugers.

To further reduce the risk of landslides, Berkeley Lab has installed numerous slope stability wells. Slope stability wells are designed to allow the extraction of groundwater to lower the water table and reduce the risk of landslides. To increase the effectiveness of the wells, the space around them is filled with gravel to near the surface. Some of these wells have inadvertently created a conduit for potential contaminant migration from the surface to the groundwater. Depending on whether or not

these wells are still required for slope stability purposes in areas of known contamination, three approaches are being used to accomplish interim corrective measures.

- If a well is needed for slope stability, its construction is modified to minimize downward migration of contaminated surface water. This is done by redrilling the well and providing at least 20 feet of a cement seal in the space around the well from the ground surface to the screened interval of the well.
- If a well is not needed it is abandoned according to regulations thereby eliminating a pathway.
- If a well is needed to test for groundwater contamination, then the well is reconstructed into a monitoring well to prevent downward migration of surface water.

Several localized areas of groundwater contamination (groundwater plumes) have been identified at Berkeley Lab. (See Figure 1: Site Map) As an interim corrective measure to control plumes that could migrate offsite or contaminate surface water, the lab is using extraction wells and sub-drains to capture the plumes. Extracted water is treated (contaminants removed) prior to being recycled for industrial use on site or released to the sanitary sewer in accordance with the East Bay Municipal Utilities District permit.





## Future Activities

Berkeley Lab will continue to evaluate the need for implementing interim corrective measures (source removals, stopping discharge of contamination to surface water, eliminating potential pathways for groundwater contamination, and preventing further migration of contaminated groundwater) where the presence or movement of contamination poses risk to human health or the environment.

## How have funding cuts over the past few years affected the ERP?

This question has been included to address public inquiries on funding.

The Department of Energy's (DOE's) budget reductions over the last two years have not had a major impact on Berkeley Lab's ability to meet its ERP goals as planned. This is because the laboratory has adapted to the cuts and worked effectively with regulators. For instance, Berkeley Lab and the regulators reexamined proposed investigations to prioritize them according to potential risk to human health and the environment.

Additionally, Berkeley Lab has obtained approval from the Regional Water Quality Control Board (RWQCB) to decrease the sampling frequency for wells that are clean. However, the laboratory will have to reassess its ERP goals and schedule if DOE funding cuts continue.

# Energy Information Center

## U.S. DEPARTMENT OF ENERGY OAKLAND OPERATIONS OFFICE

The Energy Information Center (EIC) serves as the "regional clearinghouse" for accessing information and point of contacts at the Oakland Operations Office, National Laboratories, and the U.S. Department of Energy complex nationwide.

### EIC Hours and Location:

Monday thru Friday 9:00 a.m. to 4:00 p.m.  
Closed Saturdays, Sundays, and Holidays

### Oakland Federal Building

1301 Clay Street, Suite N180 (North Tower)  
Oakland, California 94612  
(510) 637-1762

## INFORMATION REPOSITORY UPDATE

Quarterly progress reports are added to the information repository on a regular basis. These reports provide details of planned and current ERP activities at Berkeley Lab. The information repositories are at the following locations:

## PUBLIC REPOSITORY

Berkeley Public Library  
2090 Kittredge Street  
Berkeley, CA 94704  
(510) 649-3926

Contact: *Andrea Moss*

### Hours of Operation

M-Th	10 am-9 pm
F-Sat	10 am-6 pm
Sun	1 pm-5 pm

## EMPLOYEE REPOSITORY

Lawrence Berkeley National Laboratory  
50 Main Library  
One Cyclotron Road  
Berkeley, CA 94720  
(510) 486-6307

Contact: *Carol Backhus*

### Hours of Operation

M-F 8 am-5 pm

If you have questions about the ERP, you may write or call Shaun Fennessey at the Community Relations Office:

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Berkeley, CA 94720  
(510) 486-5122